**Amendment to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims:**

1. (currently amended) An optical element comprising a structure having at least one convex portion and at least one concave portion formed so as to be adjacent to one of the convex portions, at least one surface of the structure being covered, the optical element having a hollow portion,

wherein an aspect ratio of the concave portion is set to be 2 or more, the aspect ratio being a depth/width ratio of the concave portion, and

wherein the at least one surface of the structure is covered with a covering layer formed by a deposition process such that ~~the concave portion is devoid of the covering layer~~ the height of the hollow portion is the same as the depth of the concave portion.

2. (original) The optical element according to claim 1, further comprising a substrate, wherein the structure is placed on the substrate.

3. (original) The optical element according to claim 1, further comprising a substrate and a solid layer stacked on the substrate, wherein the structure is placed on the solid layer.

4. (original) The optical element according to claim 1, wherein at least one of the convex portion and the concave portion is disposed so as to have a periodic structure.

5. (original) The optical element according to claim 4, wherein at least one of the convex portion and the concave portion is disposed so as to have a one-dimensional periodic structure.

6. (original) The optical element according to claim 4, wherein at least one of the convex portion and the concave portion is disposed so as to have a two-dimensional periodic structure.

7. (original) The optical element according to claim 1, wherein the convex portion has a multi-layered structure.

8. (original) The optical element according to claim 7, wherein the number of the convex portions is one, and a plurality of the concave portions are formed.

9. (original) An optical element comprising a plurality of the optical elements of claim 1, wherein the plurality of optical elements are stacked.

10. (original) The optical element according to claim 1, further comprising an optical component for controlling light, wherein the optical component is placed on the structure.

11. (original) The optical element according to claim 10, wherein the optical component is at least one selected from the group consisting of a lens, a mirror, and an optical waveguide.

12. (original) The optical element according to claim 5, wherein the convex portion and the concave portion are arranged periodically in an alternate manner, a depth of the concave portion is larger than ½ times a width of the concave portion, and an arrangement period between the convex portion and the concave portion of the structure is in a range of 1/20 times to 20 times a wavelength of light to be used.

13. (original) The optical element according to claim 12, wherein the depth of the concave portion is twice or more the width of the concave portion.

14. (original) The optical element according to claim 1, further comprising an upper cladding layer, a lower cladding layer, and a core layer having a refractive index higher than those of the upper cladding layer and the lower cladding layer,

wherein the core layer is interposed between the upper cladding layer and the lower cladding layer, and

the structure is placed in the core layer.

15. (original) An optical circuit comprising: the optical element according to claim 14 wherein the structure is a diffraction grating for first-order diffracting incident light; and incident portion; and a focusing portion,

wherein the incident portion controls a spread angle of light incident upon the optical element,

the focusing portion focuses light demultiplexed to light having a plurality of different wavelength components by the optical element, and

the incident portion and the focusing portion are placed in the core layer.

16. (original) The optical circuit according to claim 15, wherein at least one of the incident portion and the focusing portion is a concave mirror.

17. (original) The optical circuit according to claim 16, wherein the concave mirror is formed of an interface between the core layer and a space formed in the core layer.

18. (original) The optical circuit according to claim 15, wherein the incident portion and the focusing portion are concave mirrors,

the concave mirrors are formed of an interface between the core layer and a space formed in the core layer, and

a shape of the interface between the core layer and the space forming the concave mirror is a part of a parabola surface.

19. (previously presented) The optical circuit according to claim 15, wherein the incident portion and the focusing portion are concave mirrors, and assuming that an incident angle of light to a concave mirror that is the incident portion is $\alpha_1$, an incident angle of light to a concave mirror that is the focusing portion $\alpha_2$, an incident angle of light incident upon the structure that is the diffraction grating is $\beta_1$, and output angle of light output from the structure that is the diffraction grating is $\beta_2$, a grating period of the structure that is the diffraction grating is $a$, a minimum channel spacing is $\Delta\lambda$, a central wavelength is $\lambda_0$, and a diffraction order is $m$, the following conditions are satisfied:

a width of the structure that is the diffraction grating capable of diffracting light is equal to $2a * ( \lambda_0/\Delta\lambda)/m$ or more,

a width of the concave mirror that is the incident portion capable of reflecting light is equal to $2a * \cos \beta_1 * ( \lambda_0/\Delta\lambda)/(m * \cos \alpha_1)$ or more, and

a width of the concave mirror that is the focusing portion capable of reflecting light is equal to $2a * \cos \beta_2 * ( \lambda_0/\Delta\lambda)/(m * \cos \alpha_2)$ or more.

20. (original) The optical circuit according to claim 15, wherein the incident portion and the focusing portion are concave mirrors, and the optical circuit comprises a light input portion for allowing light to be incident upon the incident portion that is the concave mirror, and a plurality of light output portions for combining a plurality of light beams output from the focusing portion that is the concave mirror.

21. (original) The optical circuit according to claim 20, wherein the light input portion and the light output portion are placed in the core layer.

22. (currently amended) A method for producing an optical element, comprising covering at least one surface of a structure having at least one convex portion and at least one concave portion formed so as to be adjacent to either one of the convex portions, thereby producing at least one hollow portion,

wherein an aspect ratio of the concave portion is set to be 2 or more, the aspect ratio being a depth/width ratio of the concave portion, and

wherein the at least one surface of the structure is covered with a covering layer formed by a deposition process such that ~~the concave portion is devoid of the covering layer~~ the height of the hollow portion is the same as the depth of the concave portion.

23. (original) The method for producing an optical element according to claim 22, wherein, after the structure is provided on a substrate or on a solid layer stacked on the substrate, at least one surface of the structure is covered with a film formed by a deposition process.

24. (previously presented) The method for producing an optical element according to claim 22, wherein the deposition process is at least one selected from the group consisting of chemical vapor deposition, physical vapor deposition, and flame hydrolysis deposition.

25. (original) The method for producing an optical element according to claim 22, wherein the convex portion and the concave portion of the structure are formed by photolithography or etching.

26. (new) The method for producing an optical element according to claim 22, wherein the hollow portion is produced substantially only by the formation of the concave portion and the deposition of the covering layer.